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CORN: *Zea mays* L. 'DeKalb DKC62-78RIB'

EVALUATION OF LIQUID AND GRANULAR INSECTICIDE FORMULATIONS COMPARED TO COMMERCIAL STANDARDS AT PLANTING FOR LARVAL CORN ROOTWORM CONTROL, 2016

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Western corn rootworm (WCR): *Diabrotica virgifera virgifera* LeConte

Liquid and granular insecticide formulations applied at planting were evaluated for effectiveness of larval CRW control near Clay Center, NE during 2016. Trial site was late-planted corn and pumpkins (insecticide free) during 2016. Experimental design was a RCB with four replicates. Plot size was 4 rows x 70-76 ft length with 30-inch row spacing. Soil type was a Crete silt loam. 'DeKalb DKC62-78RIB' (contains GENVT2PRIB [Genuity VT Double Pro] insect and herbicide traits) corn hybrid was planted on 07 May with a 2-row JD 7100 Maximerge planter with finger pickup seed units. The corn hybrid received a seed-applied treatment of Poncho 500 (clothianidin @ 0.5 mg ai/kernel) and Votivo. A variable wind @ 6-13 mph occurred at planting. Liquid insecticides were applied IF in 5 GPA water solution via a compressed air system. Granular insecticides were applied IF via the SmartBox application system. Initial CRW egg hatch was first documented on 02 Jun. Plant populations were evaluated on 15 Jun. The total number of plants per plot was recorded and converted to plants per acre (PPA). Extended leaf height (ELH) of twenty plants per plot was recorded in inches on 20 Jun. Initial adult CRW emergence was witnessed on 27 Jun. The total number of root lodged plants per plot due to larval CRW feeding were recorded on 11 Jul and converted to percentage root lodged plants. Larval feeding damage was evaluated on 26 Jul. Five randomly selected plants were dug from each plot, washed, and rated using the Iowa State 0-3 scale (0 = no feeding, 1 = one node of roots pruned to within 1.5 inches of the stalk, 2 = two nodes of roots pruned to within 1.5 inches of the stalk, 3 = 3 or more nodes of roots pruned to within 1.5 inches of the stalk). Percent consistency performance levels were calculated by determining the percentage of rated roots in each plot with an Iowa 0-3 scale root injury rating < or = to 0.25. Plots were machine harvested on 11

Oct. Percent moisture and lbs of grain were recorded and corrected to 56 lbs/bu @ 15.5% moisture to evaluate yield levels. Data were analyzed by PROC MIXED with mean separation using differences of least square means (P = 0.05).

From planting (07 May) to larval feeding damage evaluation (26 Jul), rainfall totaled 8.65 inches and overhead irrigation, 6.50 inches. Mean root injury ratings (Iowa 0-3 Scale) for the untreated check averaged 1.01. All formulations significantly enhanced grain yields, reduced larval rootworm injury and reduced early season root lodging percentages compared to the untreated check. Furthermore, Aztec HC applied at planting did perform statistically better than the A21370B formulation based on average root injury ratings (Iowa 0-3 Scale). This research was supported by industry gifts of pesticide and research funding.

Treatment/ Formulation	Rate-amt form /1000 row ft	Place -ment	Yield[c] (bu/acre)	Root Injury Rating[c]	% Consistency Iowa 0-3 Scale ≤ 0.25[d,e]	% Root Lodging[c]	ELH[d] (inches)	PPA[d]
Force CS[a]	0.46 fl oz	IF	260.8 a	0.37 ab	70	0.3 a	37.3	34,634
AMV1091[a]	0.44 fl oz	IF	259.6 a	0.32 ab	70	0.4 a	36.6	35,089
SmartChoice HC[b]	1.7 oz	IF	258.8 a	0.28 ab	69	0.0 a	37.8	35,111
A21370B[b]	1.2 oz	IF	254.8 a	0.59 b	45	0.2 a	36.8	35,186
AMV1118[a]	0.71 fl oz	IF	254.4 a	0.31 ab	75	0.0 a	36.6	35,459
Aztec HC[b]	1.5 oz	IF	254.3 a	0.24 a	85	0.0 a	36.9	34,863
Untreated Check	---	---	239.9 b	1.01 c	40	32.7 b	37.1	35,140
		P	0.0096	0.0021	0.0836	0.0043	0.3253	0.6933

[a]Liquid insecticide applied in a 5 GPA water solution at planting.

[b]Granular insecticide applied with the SmartBox application system.

[c]Means in column followed by the same lower case letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

[d]Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

[e]Averages were converted by the angular transformation of percentages to degrees, before MIXED, original percentages are reported.

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Brand Name	Formulation	Common Name	Composition	Manufacturer
A21370B		unknown		Amvac 4100 E. Washington Blvd. Los Angeles, CA 90023
AMV1091		unknown		
AMV1118		unknown		
Aztec	HC	tebupirimphos AND cyfluthrin	(*RS*)-[*O*-(2-*tert*-butylpyrimidin-5-yl) *O*-ethyl *O*-isopropyl phosphorothioate] AND (*RS*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*RS*,3*RS*;1*RS*,3*SR*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	
SmartChoice	HC	chlorethoxyfos	*O*,*O*-diethyl (*RS*)-*O*-(1,2,2,2-	

		AND bifenthrin	tetrachloroethyl) phosphorothioate AND 2-methylbiphenyl-3-ylmethyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	
Force	CS	tefluthrin	2,3,5,6-tetrafluoro-4-methylbenzyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	Syngenta Crop Protection, LLC P.O. Box 18300 Greensboro, North Carolina 27419-8300